REMARKS

Applicants thank the examiner for the indication that claims 33 and 34 contain allowable subject matter. Claims 1-5, 7-13, and 26-34 are currently pending. Claim 6 has been cancelled and claims 14-25 are withdrawn from prosecution. Claims 1 and 11 are amended. Support for the amendments can be found at least at page 8, lines 20-21 (do not communicate by inductive coupling). The remaining amendments to claim 11 serve to clarify the claim meaning. No new matter has been added by these amendments.

Section 102(e) Rejection Over Cimochowski et al.

Claims 1-2, 4-5, 7-13, and 26-31 stand rejected under 35 U.S.C. §102(e) as anticipated by U.S. Patent No. 5,967,986 ("Cimochowski et al."). The Office action cites Cimochowski et al. as teaching an antenna based device that receives power and transducer selection data from a primary controller and transmits the results back to the controller. Further, the Office action asserts that Cimochowski et al. teaches that for deep implants, frequencies of 100 MHz are used, and for shallow implants, much higher frequencies may be used. According to the Office action, Cimochowski et al. suggests that up to 1 GHz frequencies may be used with no anticipated problems.

Applicants respectfully submit that Cimochowski et al. does not anticipate claims 1-2, 4-5, 7-13 and 26-31 for at least the following reasons. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." MPEP §2131.01 *citing Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987). The Cimochowski et al. system communicates only through inductive coupling. Cimochowski et al. specifically teaches that higher frequencies are to be used when the implant is only a few millimeters below the skin, and thus, close to the controller. (Declaration of Gerard Sormann ("Sormann Decl.") at ¶9.)) Further, Cimochowski et al. teaches that the dielectric constant of the higher frequencies has little effect on power/data signal coupling. (Id.) Therefore, Cimochowski et al. only teaches

the use of inductive coupling, or near-field effects. Thus, the limitation of the claimed invention wherein the primary controller and the antenna based device do not communicate by inductive coupling is not met by Cimochowski et al. Nor does Cimochowski et al. teach or suggest the frequency limitations of claims 1-2 and 11-12. Applicants, therefore, respectfully request that the rejection be withdrawn.

Section 103(a) Rejections

Cimochowski et al. in view of Forsell

Claims 1-2, 4-5, 7-13, and 26-31 stand rejected under 35 U.S.C. § 103(a) as obvious over Cimochowski et al., alone, or in view of U.S. Patent No. 6, 210,347 ("Forsell"). The Office action cites Forsell as showing that the use of GHz carrier frequencies for the transmission of power and or data in the Cimochowski et al. scheme would have been within the level of skill in the art.

Applicants respectfully submit that the Office action has failed to set forth a *prima facie* case of obviousness as the cited references, alone or in combination, fail to teach or suggest all the elements of the claimed invention. "To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." MPEP §2143.03 *citing In re Royka* 490 F.2d 981 (CCPA 1974).

As discussed above, the system taught by Cimochowski et al. utilizes only inductive coupling for the communication between the implant and the controller. Cimochowski et al. does not teach or suggest to one of ordinary skill in the art that far-field effects may be used to transmit energy between the implant and the controller instead of inductive coupling. (Sormann Decl. at ¶6.) Cimochowski et al. specifies that the implant and the controller must be closely situated so that they are within each other's magnetic field. (Sormann Decl. at ¶9.). One of ordinary skill in the art would understand this to mean that the implant and the controller were communicating solely through inductive coupling and not utilizing far-field

effects. (Id.) Nor would such a disclosure lead one of ordinary skill in the art to utilize far-field effects.

Magnetic inductive coupling, the system used by Cimochowski et al., transfers power by creating a magnetic field about the external device in close proximity to the implanted device such that the implanted coil is within the magnetic field created by the external device. (Sormann Decl. at ¶7.) The magnetic field then causes an electric current within the implanted coil. (Id.) It is thus necessary for the implanted device to be placed close to the undersurface of the skin. (Id.)

The magnetic field in the external device may be created by running an electric current through a similar (matching) wire coil in the external device. (Sormann Decl. at ¶7.) The greater the current passed through the coil, the greater the magnetic field. (Id.) Because the implanted device must remain within the magnetic field of the external device to create the coupling effect, energy transfer by magnetic inductive coupling requires that the implanted device is in close proximity to the external device. (Id. at ¶8.) The effectiveness of the magnetic coupling diminishes as the distance between the two coils increases; this may be represented by $1/d^3$, where d is the distance between the coils. (Id.) Thus, the device in Cimochowski et al. will only work if the implanted device and the external device are in close proximity. (Id.)

In contrast, the present invention utilizes the far-field effect of electromagnetic radiation (EMR). (Sormann Decl. at ¶12.) EMR transmits energy in a wavelike pattern from a source in all directions. (Id.) EMR can propagate over distance and through materials such as tissue and air. (Id.) The energy of EMR waves diminish as the distance from the source decreases; this may be represented by 1/d, where d is the distance between the sources. (Id.) There is much less decrease over distance as compared to magnetic inductive coupling, as used in Cimochowski et al. (Id.) Thus, in the present invention, the antenna based device, or receiving antenna, does not have to be placed in close proximity to the primary controller, or

transmitting antenna. (Id.) Further, the antenna may be of any shape since it is not relying on a magnetic field to transfer electric current. (Id.)

Because Cimochowski et al. requires that the implanted device must be in close proximity to the external device, it does not teach or suggest to one of ordinary skill in the art that far-field effects may be used to communicate between the internal and external devices. Nor does it teach or suggest to one of ordinary skill in the art that the primary controller and the antenna based device would be able to communicate through some method other than inductive coupling. Forsell fails to cure the deficiencies of Cimochowski et al. discussed above. Further, as discussed above, Cimochowski et al. does not teach or suggest the frequency ranges of claims 1-2 and 11-12. Therefore, Applicants respectfully request that the rejection of claims 1-2, 4-5, 7-13 and 26-31 be withdrawn.

Cimochowski et al. in view of Forsell and Mehra

Claim 32 stands rejected under 35 U.S.C. § 103(a) as obvious over Cimochowski et al., alone or in view of Forsell, and further in view of U.S. Patent No. 5,170,802 ("Mehra"). The Office action cites Mehra as teaching the use of stents for pacing.

Again, Applicants respectfully submit that the Office action has failed to put forth a *prima facie* case of obviousness as the cited references, alone or in combination, do not teach or suggest all of the limitations of the claimed invention. Forsell and Mehra fail to cure the deficiencies of Cimochowski et al. discussed above. Nor do Cimochowski et al. and Forsell teach or suggest a system comprising a medical appliance for providing artificial stimulation to a muscle. Applicants therefore, respectfully request that the rejection be withdrawn.

Cimochowski et al. in view of Ponnapalli et al.

Claim 3 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Cimochowski et al. in view of U.S. Patent No. 5,583,510 ("Ponnapalli et al."). The Office action cites Ponnapalli et al. as teaching a conventional planar omnidirectional antenna and asserts that it

would have been obvious to substitute the antenna of Ponnapalli et al. for the antenna of Cimochowski et al.

Again, Applicants respectfully submit that the Office action has failed to put forth a *prima facie* case of obviousness as the cited references, alone or in combination, do not teach or suggest all of the limitations of the claimed invention. As is discussed above, Cimochowski et al. does not teach or suggest the "no inductive coupling" limitation of the claimed invention. Ponnapalli et al. does not cure this deficiency. Thus, the Office action has not set forth a *prima facie* case of obviousness.

Nor would one of skill in the art be motivated to combine the disclosure of the conventional planar omnidirectional antenna of Ponnapalli et al. with the system disclosed in Cimochowski et al. because Cimochowski et al. only teaches the use of inductive coupling for communication between the implant and the controller. Inductive coupling requires the use of coiled antenna and would not work with the planar antenna disclosed in Ponnapalli et al. Therefore, Applicants respectfully submit that claim 3 is not obvious over Cimochowski et al. in view of Ponnapalli et al. and request that the rejection be withdrawn

CONCLUSION

In view of the foregoing, Applicants respectfully submit that the claims as amended are in condition for allowance. The Examiner is invited to contact the undersigned by telephone should any issues remain with respect to the application.

Respectfully submitted,

Charlene L. Yager
Reg. No. 48,887

Docket No.: 064194-9004
Michael Best & Friedrich LLP
One South Pinckney Street
P. O. Box 1806
Madison, WI 53701-1806
(608) 257-3501